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CASE REPORT

A case of COVID-19 patient with the diarrhea as initial symptom and literature review



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KEYWORDS

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Summary Since Dec 2019, a cluster of pneumonia outbreak in Wuhan, Hubei province, China, and soon spread to all province of China. The pathogen was proved to be a novel betacoronavirus called 2019 novel coronavirus (officially named by the World Health Organization as COVID-19). The typical clinical manifestations were fever, cough, dyspnea, and myalgia or fatigue. Less common symptoms included headache, diarrhea, nausea and vomiting. However diarrhea as the first symptom is rarely reported. Here we reported a case of 2019 novel coronavirus-infected patient (NCIP) with diarrhea as the initial symptom. Image of CT scan and laboratory examination and careful collected as well as detection of viral RNA in pharynx. The case demonstrate that gastrointestinal symptoms were not rare in NCIP, and diarrhea could be the initial symptom. © 2020 Elsevier Masson SAS. All rights reserved.

Introduction

Since December 2019, a cluster of pneumonia outbreak in Wuhan, Hubei province, China, and soon spread to all province of China [1]. The pathogen was proved to be a novel betacoronavirus called 2019 novel coronavirus [2]. By Feb 18, 2020, a total of 72532 patients in China have been diagnosed with the novel coronavirus-infected pneumonia

(NCIP), and 1872 patients have died. The typical clinical manifestations were fever, cough, dyspnea, and myalgia or fatigue [3]. Less common symptoms included headache, diarrhea, nausea and vomiting [4,5]. However diarrhea as the first symptom is rarely reported. Here we report a case of NCIP with diarrhea as the initial symptom.

Case report

A 62-year-old man with diarrhea for 3 days and fever for 2 days was admitted to the Fever clinic of the First Affiliated Hospital of Anhui Medical University (AHMU) in Feb 7,

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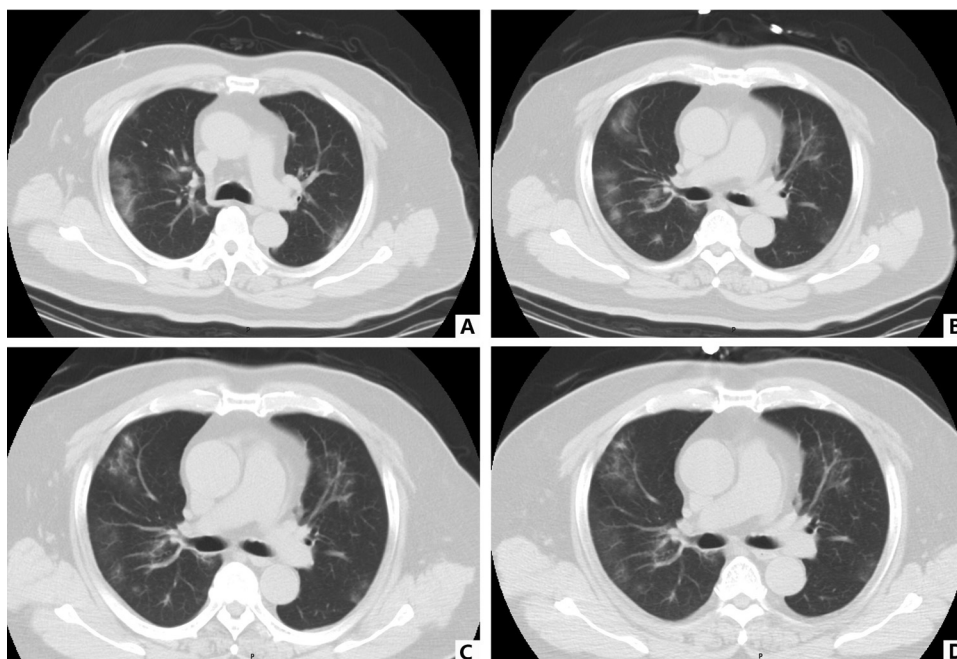


Figure 1 Picture A and B: Scanned on February 10, 2020; Picture C: Scanned on February 15,2020; Picture D: Scanned on February 20, 2020.

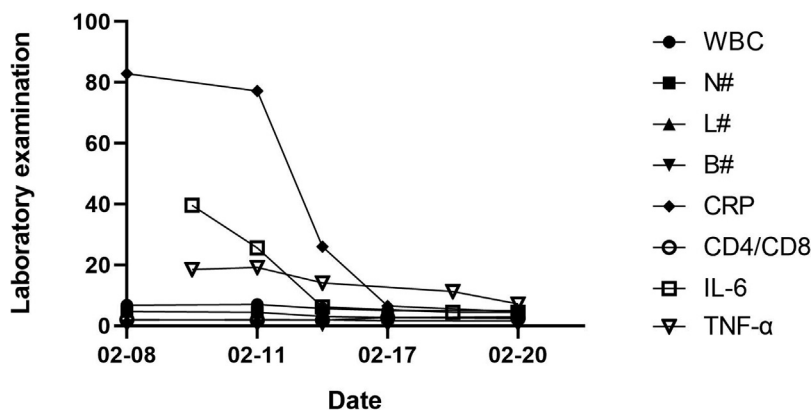


Figure 2 Abbreviation: WBC ($10^9/L$): White blood cell, N#($10^9/L$): Absolute number of Neutrophil, L#($10^9/L$): Absolute number of Lymphocyte, B#($10^9/L$): Absolute number of Eosinophils, CRP(mg/L): C-reactive Protein, CD4/CD8: Ratio of CD4 cells to CD8 cells, IL-6(pg/ml): Interleukin-6, IL-2R(U/ml): Interleukin-2R, TNF- α (pg/ml): Tumor necrosis factor- α .

2020. The patient had a history of hypertension, diabetes and hyperlipidemia, but controlled well. 10 days ago, he had contacted with his son-in-law who went to Wuhan for a meeting on January 21 and was recently diagnosed as NCIP. The patient had diarrhea 2-3 times a day on February 4, which was yellow paste stool. One day later, the patient developed chills and fever, with a maximum body temperature of 37.4°C. On February 6, the patient had a dry cough and chest tightness. The patient complained of poor appetite and low urine volume (about 500 ml per day) recently.

The physical examination showed the body temperature was 38.3°C. Biochemical examination showed that leukocytes ($6.8 \times 10^9/L$), ratio of neutrophils (68.80%) and lymphocytes (27.6%), procalcitonin (<0.05 ng/ml) were all in the normal range, while the ratio of eosinophils

to leukocytes (0.1%) decreased slightly. C-reactive protein (82.90 mg/L), glucose (9.76 mmol/L), CD4/CD8 (2.06) elevated significantly. Immune examination showed the antibodies of Legionella pneumophila, Mycoplasma pneumoniae, Coxiella burnetii, Chlamydia pneumoniae, adenovirus, respiratory syncytial virus, influenza A virus, influenza B virus, parainfluenza virus (1,2,3) were all negative. Among the inflammatory factors, ferritin (876.90 $\mu\text{g/L}$), interleukin-6 (39.6), interleukin-2r (744.0) and Tumor necrosis factor- α (18.5) increased significantly. Finally, he was diagnosed with 2019-nCoV based on the real-time reverse-transcriptase-polymerase chain reaction (rRT-PCR) amplification of the viral DNA from a pharyngeal examination sample. CT scan showed multiple patchy/ground glass shadows in both lungs, as shown in Fig. 1.

The patient was placed in a special isolation ward and was treated with Lopinavir and Ritonavir tablets. Interferon- α , Thymalfasin and traditional Chinese medicine were also used for this patient because of his old age, relatively serious illness and underlying diseases. The results of laboratory examination during hospitalization were showing in Fig. 2. The nucleic acid test results of pharyngeal virus of patients were positive on February 10, February 15, February 18 and February 20, and finally turned negative on February 23.

Discussion

The 2019-nCoV (officially named by the World Health Organization as COVID-19) is the seventh member of the coronavirus family which includes two highly pathogenic viruses (SARS-CoV and MERS-CoV) causing severe respiratory syndrome in humans and four other coronaviruses (HCoV-OC43, HCoV-229E, HCoV-NL63, HCoV-HKU1) causing mild upper respiratory disease [4–6]. The majority of patients have respiratory symptoms. Laboratory examination shows that the absolute number of leukocytes, neutrophils and lymphocytes decrease in most patients, while CRP increases significantly and procalcitonin is usually normal [7]. The main manifestations on CT are patchy/punctate ground glass opacities with a single lobe or multiple lobes involvement [8]. However, in our case, leukocytes, ratio of neutrophils and lymphocytes remains normal. These differences can be attributed to the relatively mild symptoms of patient.

It is reported that the sequence of 2019 nCoV receptor-binding domain (RBD) is similar to that of SARS-CoV, and angiotensin-converting enzyme 2 (ACE2) is the receptor. Meanwhile some critical residues in 2019 nCoV receptor-binding motif (RBM) also provide favorable interactions with ACE2 receptor in human cells [9]. Some researcher searched NCBI's open database and found that ACE2 receptor was highly expressed in the human small intestine, mainly in proximal and distal enterocytes. Studies showed that ACE2 receptor can control intestinal inflammation and diarrhea, so the virus may induce diarrhea by binding to ACE2 receptor, interfering with its normal function [5,10]. Interestingly, although differences in RBD regions between SARS-CoV and 2019 nCoV do not significantly affect their ability to bind to ACE2 receptors, they have a significant impact on cross-reactivity of antibody, causing some antibodies that can bind SARS CoV to fail to bind 2019nCoV [11].

In our case, the patient suffered from diarrhea as the initial symptom, which was relatively rare in NCIP. 4 in all 38 NCIP patients in our hospital had diarrhea symptoms, with a incidence rate of about 10.8%, which is consistent with the reports of other researchers [1,3–5,7]. This was a quite low rate compared with SARS, which reported to be 20-25% [12], and the mechanism remained unknown. Wan's research showed that 2019 nCoV recognizes human ACE2 less efficient than human SARS-CoV (year 2002), but more efficient than human SARS-CoV (year 2003) [9]. Different affinity with ACE2 receptor may lead to significant difference in the incidence of diarrhea, but more data is needed to explore and confirm this.

In a recent case reported by Zhoushan Health Commission, the suspected patient had contact with the patients (his father) confirmed by NCIP, but there was no obvious res-

piratory symptoms and typical CT manifestations. The virus RNA in pharyngeal test was negative, but it was positive in feces [13]. Molecular binding and clinical cases indicate the affinity between the virus and gastrointestinal tract, which also provides the possibility for the fecal oral transmission of the virus [14].

In conclusion, we reported the clinic feature and laboratory examination of a NCIP patient with diarrhea as the initial symptom. Possible mechanism for diarrhea in NCIP patients was also discussed. When a patient comes for diarrhea, it is necessary to ask in detail whether he has the history of contacting with epidemic area or confirmed patient. For patients with fever and typical CT findings, NCIP should be considered and 2019 nCoV RNA examination should be completed in time.

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Authors' contributions

Xiaodong Yang: drafting and editing manuscript.

Jie Zhao: acquisition of data.

Qiang Yan and Shangxin Zhang: analysis, and interpretation of data.

Yigao Wang: analysis and interpretation of data.

Yongxiang Li: analysis and interpretation of data, revise manuscript.

Disclosure of interest

The authors declare that they have no competing interest.

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